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ABSTRACT

Exploratory research has indicated that interpersonal dominance is one of the strongest correlates of Type A behavior, although little effort has been made to demonstrate a link between the behavioral manifestation of interpersonal dominance and Pattern A responding. To establish such a link two studies were conducted. In the first study, extreme A (N=12) and extreme B (N=11) subjects, as determined by the Jenkins Activity Survey, judged differences in stimuli following an Asch conformity paradigm. The results, which were significant, showed that Type B subjects conformed twice as much as Type A subjects. The same task administered to a subset of the sample and a larger normative sample indicated that social pressure to conform was responsible for differences in judgmental accuracy of stimuli (conformity measure). In the second study, all possible combinations of extreme As (N=42) and Bs (N=42) were matched in dyads to negotiate extreme bi-polar opposite positions on a "teacher dismissal" issue. Analysis of the process and outcome behaviors suggested that Type A individuals were unilaterally more dominant than their Type B counterparts. Future research is needed to define the situational parameters of the Type A individual's dominance behavior and the physiological concomitants of dominance struggles. (Author/BL)

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Interpersonal Dominance and Coronary-Prone Behavior

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Abstract

Type A "coronary-prone" behavior is known to be an important causal factor in the etiology and ontogenesis of coronary-artery and heart disease. Exploratory research indicates that interpersonal dominance is one of the strongest correlates of Type A behavior, although little effort has been made to demonstrate a link between the behavioral manifestation on interpersonal dominance and Pattern A responding. Two studies were conducted to establish such a link. Based upon previous findings that dominance is negatively correlated with conformity, it was hypothesized that Type A subjects would exhibit greater nonconformity than Type B subjects. Accordingly, extreme A (n=12) and B (n=11) subjects were run using an Asch conformity paradigm. The results showed that Type B subjects conformed twice as much as Type As, a significant difference ($p<.02$). The same task administered to a subset of the sample and a larger normative sample indicated that social pressure to conform was responsible for differences in judgemental accuracy of stimuli (conformity measure). In Experiment Two, all possible combinations of extreme As (n=42) and Bs (n=42) were matched in dyads which negotiated extreme bi-polar opposite positions on a "teacher dismissal" issue. Analyses of process and outcome behaviors suggested that Type A individuals are unilaterally more dominant than their Type B counterparts. Possible restrictions on these results and physiological mechanisms mediating dominance and cardiovascular disease are discussed in the context of recommendations for future research.

A wealth of evidence is accumulating which supports the implication of Type A "coronary-prone" behavior as an independent risk factor in the etiology and ontogenesis of coronary-artery and heart disease (CAHD). Medical, physiological and psychophysiological studies have demonstrated numerous cardiopathogenic biochemical, neuroendocrine and anatomical correlates of Pattern A responding (for reviews see Dembroski, Weiss, Shields, Haynes, & Feinleib, 1978; Friedman & Rosenman, 1974; Glass, 1977). Psychological research has focused upon elucidating the behavioral correlates of the Type A pattern, and evidence suggests that Type As are more time urgent (Glass, Snyder, & Hollis, 1974; Gastorf, 1980; Yarnold & Grimm, 1982), competitive (Gastorf, Suls, & Sanders, 1980; Grimm & Yarnold, 1984; Matthews, Helmreich, Beane, & Lucker, 1980; Van Egeren, 1979), and hostile (Carver & Glass, 1978; Glass, 1977; Glass et. al., 1974) than Type Bs, who do not exhibit Pattern A responding (for reviews see Glass, 1977; Matthews, 1982; Yarnold, Note 1). Recent research has begun to investigate potential mediator variables in the hope of identifying sub-types of extreme Type As at particularly high risk for developing CAHD (e.g., Grimm & Yarnold, in press; Hansson, Hogan, Johnson, & Schroeder, 1983; Jenkins, Zyzanski, Ryan, Flessas, & Tannenbaum, 1977).

Friedman and Rosenman (1974) have noted that nonlaboratory manifestation of Pattern A responding may often be characterized as being interpersonal in nature. Indeed, two of the primary factors of the Type A constellation include achievement orientation and competitiveness, both of which are interpersonal constructs (Glass, 1977). While few studies have examined the behavior of As and Bs in an

interpersonal context, evidence suggests that As are more competitive than Bs. Matthews et. al. (1980) found measures of Type A positively correlated with a scale measuring the desire to win in interpersonal situations, and Jenkins et. al. (1978) found As more interested than Bs in "moving up the social ladder" vis a vis achievement rather than establishing significant, "emotionally-based" relationships. Sales (1969) reported positive correlations between Pattern A and measures of competitive orientation, desire for objective public esteem (i.e., through task mastery), and a desire for leadership positions. Similarly, Pennebaker and Glass (cited in Glass, 1977) have documented the greater athletic competitiveness of As in high school, and the greater academic competitiveness (undergraduate awards) of As in college. Evidence also suggests that As become more physiologically aroused during interpersonal competition than Bs (Van Egeren, 1979; Wolf & Holroyd, Note 2), although these latter studies focus upon hemodynamic rather than social phenomena.

Interpersonal dominance is one variable that affects the magnitude of interpersonal competition. In leaderless discussion groups, for example, dominant members often compete for discussion time by introducing ideas and opinions for the group to discuss, guiding the discussion, making attempts to influence the group's opinion, and providing clarification by defining terms and pointing out logical difficulties (Klein & Willerman, 1979; McClintock, 1972; Megargee, 1969). Furthermore, studies in which measures of Type A have been correlated with questionnaire measures of other psychologically meaningful constructs consistently find the strongest or

next-to-strongest correlate of Type A to be interpersonal dominance (Glass, 1977; Motiff & Palladino, Note 3; Theorell, DeFaire, Schalling, Adamson, & Askevold, 1979).

Despite the apparently strong relationship between Type A behavior and predisposition toward interpersonal dominance, little literature directly addresses behavioral differences in expression of interpersonal dominance between As and Bs. Van Egeren (1979) had As and Bs play either a cooperative or competitive confederate in a mixed-motive game, but only reported hemodynamic effects discussed independently of dominance. Wolf and Holroyd (Note 2) compared the behavior of As and Bs in a bargaining task. For half of the subjects the opponent (a confederate) adopted an acquiescent bargaining strategy, whereas for the remaining subjects the confederate-opponent adopted a competitive bargaining strategy. The results showed that As began bargaining with a more self-advantagous offer and were less truthful than Bs irrespective of the strategy of their opponent. Unfortunately this study too was designed to explore the cardiovascular lability of As and Bs in contingencies under which interpersonal obstacles were or were not encountered: the role of dominance per se as a mechanism in bargaining dynamics was not explored. Finally, Carver (1980) examined As and Bs in the context of a "reactance" paradigm, in which it is hypothesized that threatening or eliminating an individual's freedom arouses a motivation to restore freedom (Brehm, 1966). The results suggested that As show more reactance than Bs to moderately coercive communications, perceiving more threat and tending to change their opinion in the direction opposite of that being

advocated. Since the communications sent to subjects in this latter study were written protocols, and the dependent measure involved comparing subjects' pre- and post-communication Likert-rated attitudes, it seems this study too fell short of examining the interpersonal style of As and Bs. Accordingly, the following two studies were conducted to explore the nature of the Type A's interpersonally dominant responding.

Experiment One

According to Glass (1977), the noted dimensions of the Type A pattern are manifestations of a desire to establish and maintain control over personal and environmental events. That self-report measures of dominance are typically found to be associated with measures of Type A is consistent with the Type A's desire for control, in this case control over another. One way in which dominance can be expressed is through resistance in following the consensus of a group. Several studies have found that dominant individuals conform less than submissive individuals (Beloff, 1958; Helson, Blake, Mouton & Olmstead, 1956; Mann, 1959; Mouton, Blake, & Olmstead, 1956). Following this line of reasoning, the following study was designed to test the hypothesis that Type A subjects would conform less than their Type B counterparts.

Method

Subjects

Eighty-seven male introductory psychology students were administered the student version of the Jenkins Activity Survey (JAS), a measure of Type A behavior (Jenkins, Zyzanski, & Rosenman, 1979). Subjects located at the extreme ends of the scale were invited to participate in the study. Based on a post-experimental questionnaire,

the data of three subjects (two Bs and one A) were discarded because they ascertained the purpose of the experiment. The final sample consisted of 12 As and 11 Bs. The mean JAS score for the 87 males was 8.13 with a standard deviation of 3.42, which is similar to the population mean reported in other studies (c.f. Glass, 1977). The mean JAS score for Type A subjects included in the present study was 12.6 (z-score=1.22) and the mean for Type B subjects was 4.3 (z-score=-1.38; $t(21)=10.45$, $p<.0001$). The mean age of As was 21.1 years, and 20.9 years for Bs.

Procedure

The experiment was conducted in a room containing four chairs 1.3 meters from a screen upon which stimuli were projected using an overhead projector. The procedure was based upon Asch's conformity paradigm (Asch, 1956), wherein three confederates and the subject make judgements regarding differences among stimuli. After being told the purpose of the experiment was to judge the differences among stimuli, the subject was seated with the three confederates. Sixteen transparencies were projected, each containing four stimuli. Each projection required a different discrimination (e.g., What is the shortest line?; Which is the largest figure?; What is the next number in the sequence?; Which angle is the smallest?); four slides of each category were projected. The order of responding among the individuals was varied so that the subject went last on only four critical trials (3, 8, 12, and 16). It was arranged so that on these critical trials, the three confederates offered the same response which in reality was incorrect. On the noncritical trials, confederates occasionally

disagreed (1% of the time). The subject's response to stimuli on critical trials was used to determine a measure of conformity.

After the judgement phase of the experiment the subject completed a manipulation check questionnaire including the items, "Did you feel you were being deceived in any way? If so, in what way?" and "What was the purpose of this experiment?" Data from subjects who mentioned "conformity" or "reaction to peer pressure" were discarded. Next, the subject was presented with xerox copies of the sixteen transparencies and asked to identify the correct response, thus allowing for a measure of accuracy in the absence of social pressure.

In order to obtain normative data on the discriminability of the stimuli on each transparency, the base rate of correct responses of As and Bs not under social pressure was obtained from 45 male undergraduates enrolled in the same introductory class (all members of the class had one month previously completed the JAS). Transparencies were presented in the same order and all subjects were asked to privately record their judgements. Although only the data of males were included, the task was presented in the context of course discussion sections including 10 to 30 students. Of the subjects participating in this normative testing, 6 As and 5 Bs had been included in the conformity portion of the study, thus, in addition, allowing for a comparison of their responses under social pressure and subsequent nonsocial influences.

In summary, A and B subjects were asked to make a series of stimulus discriminations. On four of sixteen trials the subject was forced to respond after three confederates had consensually agreed on

what was an incorrect response. Immediately after the subject responded in a group context, he was seated alone in another room and once again presented with the sixteen stimuli and asked to identify the correct response. A week later normative data was colected on a larger sample of subjects in order to obtain base accuracy rates. Approximately half of the experimental subjects participated in the normative testing phase. The experimenter was unaware of each subject's A/B classification.

Results

A conforming response was defined as the subject offering the same incorrect judgement voiced by the confederates on a critical trial (dummy coded as 1 for each conforming response). A nonconforming response occurred when the subject differed from the group consensus on a critical trial (dummy coded as 0 for each trial). Thus, a subject's conformity score could range from 0 to 4. The results indicated that Type B subjects conformed twice as often as Type A subjects (Bs, X=2.0, sd=1.2; As, X=1.0, sd=.85), although with equal variance: F-max(10,11)=1.92, ns. A one-tailed t-test performed on these data was signif[illegible]ant: $t(21)=2.34$, $p<.02$.

Immediately after subjects reponded under group pressure they responded in isolation to the same stimuli. A t-test was performed on the accuracy of judgements on critical items. While Bs were found to conform significantly more than As on critical items while under social pressure, no significant difference between As and Bs was revealed in the absence of the group: $t(21)<1$, ns. This was due to the fact that Type B subjects changed their judgements in line with the correct response.

Normative data was obtained to ascertain 1) whether or not a nonexperimental group of Type A and B subjects differ in judgemental accuracy and 2) whether or not experimental subjects differ in accuracy when not responding under conformity pressure; the latter question serving as a test-retest replication of judgemental accuracy of experimental subjects previously responding in the absence of consensual public judgements. The first analysis consisted of those subjects who did not participate in the conformity experiment. Of this sample, As (n=14) had a mean JAS score of 11.1 while Bs (n=20) had an average JAS of 5.4. This mean difference was highly significant: $t(32)=9.97$, $p<.0001$. A t-test between Type A and B nonexperimental, normative subjects on accuracy was nonsignificant: $t(32)<1$, ns. Moreover, practically no errors in judgement were noted, attesting to the fact that the correct stimulus was obviously discriminable from an incorrect stimulus. Six As and five Bs participating in the experiment were also present for normative testing. A t-test on judgemental accuracy scores between these two groups was nonsignificant: $t(9)<1$, ns; thus replicating the previous finding that experimental subjects only respond differently under pressure to conform.

Discussion

It was shown in the present study that, under social pressure, Type B subjects conformed to a significantly greater degree than Type A subjects. Subsequent normative testing and an analysis of stimulus judgements between experimental As and Bs not under social pressure to conform revealed that perceptual differences between the groups could not account for this finding. Moreover, the conformity exhibited by

Type B subjects appears to have been a transient phenomenon under the control of group pressure since these subjects readily offered the correct response to the same stimuli in the absence of the group. However, in the case of Type As, their nonconforming responses were also accurate judgements. The question arises, were Type A subjects resisting group pressure in order to provide veridical responses or were they being oppositional in which case accurate judgements were a by-product? Additional between groups analyses were conducted on noncritical trials in which the subject responded after one or two confederates gave the correct response. Rarely did subjects respond contrary to the group and no A/B differences were found (both $\underline{t}$s<1, ns), thus arguing against the oppositional hypothesis.

We would not want to conclude that Type A individuals exhibit a generalized nonconforming posture when subjected to social pressure to conform. The present study established a conformity press under circumstances rather isolated from the subjects' daily activities and long-term concerns (Klinger, 1975). Imagine the Type A person, achievement oriented, striving for occupational advancement in an organizational structure, confronted at a business meeting with a unanimous decision by his/her employers. It is conceivable that under such a contingency Type As would be more conforming than Type Bs. Additional research is needed to evaluate the impact of task salience, status of group members and subjects' perceptions of the consequences of their nonconformity in order to gain a fuller understanding of the conditions under which Type A and B individuals differ in conformity.

Finally, while it is true that 1) As score higher than Bs on self-report measures of dominance, 2) dominant subjects conform less than submissive subjects, and 3) the present results suggest that As conform less than Bs, this study did not directly assess interpersonal dominance. Rather, as in the Carver (1980) reactance study, the obtained differences in conformity more accurately represent differences in subjects' reactions to the "expressed dominance" of others.

Experiment Two

In order to directly assess differences between As and Bs in the expression of interpersonal dominance, the following study examined the behavior of As and Bs engaged in leaderless problem-solving discussion dyads under time deadlines for task completion.

Method

Subjects

A total of 652 male introductory psychology students were administered a questionnaire packet consisting of the JAS, a demographic inventory, and an inventory on the basis of which subjects in extreme conflict on a "teacher dismissal" issue were identified. Of these, 42 extreme Type A and 42 extreme Type B subjects were contacted by telephone and invited to participate in an experiment on "decision making processes" in exchange for course credit. To maximize classfication reliability only subjects scoring beyond ± 1.5 z-score were included in the study ($\bar{X}$=7.8, sd=2.6, all As>11, Bs<5). All subjects were native English-speaking Americans, and age and race were matched within and accross dyads. The final sample was 78.7% white and

7.1% each of black, oriental, and Hispanic. The mean age was 20.3 years (sd=1.8).

Design and Procedure

The design consisted of constructing three groups of dyads including one in which both members were Type As (AA), one in which members were both extreme Type Bs (BB), and one in which an extreme A and an extreme B were paired (AB).

Within dyads, subjects were in extreme conflict on a "teacher dismissal" issue (adopted from Klein & Willerman, 1979). Instructions read: "Imagine the following problem. The school district in a small community is in financial difficulty. The school board must dismiss a number of faculty members of a high school in addition to other cutbacks in order to have enough money to complete the school year. Use the scale below to indicate whether each of the faculty members should remain or be terminated." The teachers rated included reading specialist, counselor, assistant football coach, special education teacher in math, assistant band director, drama teacher, diagnostician of learning difficulties, teacher of accelerated English classes, teacher of accelerated math classes, baseball coach, work-study supervisor, and art teacher. Subjects rated each instructor using a 7-point Likert scale with 1=absolutely must remain and 7=absolutely must leave.

Fourteen of each dyad type were constructed with the restrictions that conflict be extreme (a difference of 5 or greater on the 7-point scale, thus guaranteeing that dyad members were of opposite opinions), and that the specific teachers over which conflict occurred be matched accross dyad types.

Dyads were run individually by one of two experimentally blind advanced undergraduate female psychology students. When both subjects had arrived they were seated at opposite ends of a 1 by 2 m table and read the following instructions: "This research is concerned with problem solving. The kinds of problems we are interested in are often abstract and seem to have no clear-cut solution. However, we are interested in what people's conclusions concerning these problems are and how they arrived at them. You have already encountered the problem we will be discussing today. In the questionnaire you completed in class, you probably recall the section in which you were asked to decide which teachers to layoff. The exact wording of the problem was:", at which point the dismissal issue was read. The instructions continued: "You have been selected because you were in extreme conflict on at least one of the decisions." The experimenter then announced the teacher over which conflict occurred and each member's position. The instructions continued: "I would like the two of you to discuss this disagreement for five minutes. At the end of this discussion I would like you to come to an agreement on whether or not the teacher should leave using this scale." The same 7-point scale used in pre-testing was then shown, with the teacher over which conflict occurred identified at the top. Procedural questions were then answered and the experimenter then asked which dyad member would like to record the dyad's final conclusion. The dyad conclusion form was then handed to the volunteer and the instructions continued: "I will leave you to discuss this matter for five minutes. During this time I'll tape record your discussion with this recorder (located equidistant between members on

the table). After four minutes I'll knock on the door to let you know that you have one minute left to come to a conclusion." The experimenter then turned on the recorder, asked the subjects to identify themselves the first time speaking, and closed the door behind her. Discussions were observed from behind a one-way mirror.

If the discussion terminated before five minutes had elapsed the experimenter entered the room, turned off the recorder, and continued with instructions (see below). If the discussion failed to terminate after five minutes had elapsed the experimenter entered the room, allowed subjects an additional minute, and left the room. If after the additional minute a conclusion had still not been reached she entered the room and instructed subjects to come to a conclusion. If no conclusion had been reached after a total of ten minutes had elapsed, a "no-conclusion" was recorded.

Subjects were then told that it was necessary to obtain their individual reactions to the dyad process and asked to complete another 7-point Likert scale indicating their private perception regarding the problem's "correct" solution. They were also asked to evaluate themselves and their opponent, using 5-point Likert scales, on leadership ability, dominance, understanding, and likeability (the instructions on these forms guaranteed confidentiality). The scales were anchored at the extremes by "very much higher" (1) and "very much lower" (5) than the average person. Subjects were escorted to individual rooms to complete the forms. When finished they were debriefed, thanked, and dismissed.

Dependent Measures

Outcome Variables

The first measure consisted of a dummy-coded score indicating which subject volunteered to record the dyad's conclusion, thereby assuming a position of relative control over the dyad's operation (RECORD). The second, primary measure considered which member "won" the negotiation as indicated by the public, mutually agreed-upon solution arrived at after negotiations were completed (PUBLIC WIN). Derived below, this variable reflects the relative displacement of a subject's public opinion from his initially advocated position. A third outcome measure examined the private post-negotiation solution recorded by each dyad member, in which subjects could shift from the mutual public position toward their initially advocated position (PRIVATE WIN). The final outcome measures were the ratings of self and other on the four scales presented at the conclusion of the experiment.

Process Variables

These measures considered the negotiative style of the subjects. The first was a measure of the extent to which a subject monopolized the conversation time (TIME). Using the recordings and a stopwatch the two experimenters timed the talking time of each subject to the nearest second. The remaining process measures required transcribed protocols of the dialogues, which were made by an experimentally blind technician.

Ratings of the dominant contents of each subject's responses were made according to a procedure of protocol analysis outlined by Turner (1978) and used by Klein and Willerman (1979). The (DOMINANCE) ratings were made according to the following scale: 1. No dominance statements; totally passive. 2. Statements of a general nature

(comments, statements of fact, clarifying statements); a few very weak opinions voiced with little conviction of involvement. 3. A few opinions offered; no disagreements with other expressed. May agree with other's opinions. 4. Opinions offered but no attempt to lead dyad (or a very weak one); disagreements subtle and non-direct. Might offer suggestions about organizing. 5. Opinions offered with attempts to get some agreement from other; somewhat persuasive efforts towards other. Statements solicitous to support, such as "Don't you think,..."; "How do you feel?"; "How about,..."; "What do you think?. 6. Strong attempts to persuade and open disagreement with other. Empathyic statements, such as "I think,...", may take a while to warm up but eventually takes over. Assertive about opinions; leads; not too concerned about what other thinks. 7. Complete usurpation of leadership of group with insistance upon influencing conclusions. Usurpation of leadership from the beginning. Strong opinions; not democratic; very persuasive; strong disagreements.

The first author and a trained assistant, both of whom were blind as to the A/B classification of the subjects, rated the transcribed protocols using the above scale.

The experimentally blind co-experimenters independently assessed the following variables. One measure was the number of discrete or unique arguments a subject offered in support of his positions during negotiations (DISCRETE ARGUMENTS). Another was the intensity of argumentation, defined as the total number of words used to compose a battery of arguments (NUMBER OF WORDS). The final measures included the number of times a subject "gave-in" or acquiesced to an argument

presented by his opponent (GIVE-INS), and the number of rebuttals (direct challenges to an oponent's discrete arguments) a subject made (REBUTTALS).

Results

Comparing JAS Scores

Subjects were classified as belonging to one of four groups: Type Bs from BB dyads, Bs from AB dyads, or As from AA or AB dyads. Mean JAS scores are given by group in Table 1

Insert Table 1 About Here

An analysis of variance (ANOVA) was performed on these data and revealed a significant main effect of group: $F(3,80)=284.69$, $p<.0001$. Contrasts performed using Duncan's Multiple Range Test (DMRT) revealed that Bs from BB and AB dyads had similar scores, As from AA and AB dyads had similar scores, and As had higher mean JAS scores than Bs.

Comparing Initial Conflict

Subjects initially advocated that the teacher should either remain or leave, and conflict was defined as the Likert-scale difference between their positions. Mean "remain", "leave", and "conflict" scores are given by dyad type in Table 2.

Insert Table 2 About Here

ANOVAs revealed that dyads had statistically equivalent means on all three varibales: all $Fs(2,39)<2.39$, ns. These analyses were repeated on the reduced sample for the PUBLIC WIN analysis (see below) revealing parallel results, as did reduction of AB dyads into As and Bs. Thus

extremity of inital position and magnitude of conflict was constant over dyad and A/B types.

Outcome Measures

In order to facilitate making intra-dyad comparisons, within a dyad JAS scores were contrasted such that the highest JAS score was considered the relatively high intra-dyad JAS score and the lowest JAS score as the relatively low intra-dyad JAS score. For example, in a BB dyad having members with JAS scores of 4 and 2, the subject with the JAS score of 4 would be considered the higher JAS score member. A total of 3 BB and 3 AA dyads could not be treated in this manner because their members had equivalent JAS scores. Also, 1 AA and 1 AB dyad failed to reach a conclusion. These dyads were excluded from intra-dyad analyses.

Considering first the RECORD measure, a 3(dyad type)X2(hi versus low intra-dyad JAS score) contingency table was constructed to examine the relationship between JAS score and volunteering to record the dyad's decision. The resulting chi-square of 2.75 with 2 df was insignificant. Collapsing accross dyad type led to a chi-square of 0.44 with 1 df, which was also insignificant. Thus, there was no evidence suggesting a relationship between volunteering to act as the dyad's spokesman and A/B Type.

The PUBLIC WIN analysis necessitated computing the amount of comprimise for each subject (within dyad) from his initially advocated position. The amount of comprimise was computed as the number of Likert-scale units a subject moved from initial to mutually agreed-upon ("public") position, and could range from 0 to 6: the greater this

number, the more the subject comprimised from his initial position. Then the amount of comprimise made by the low intra-dyad JAS score member was subtracted from the comprimise of his opponent. Thus numbers greater than 0 meant that the low JAS score member comprimised less, 0 meant that the members comprimised equally (i.e., "split the difference"), and a negative number meant that the low JAS score member comprimised more. Mean composite comprimise scores are given by dyad type in Table 3.

Insert Table 3 About Here

An ANOVA performed on these data was significant: $F(2,31)=4.08$, $p<.03$. DMRT revealed that the mean comprimise scores of AA and BB dyads were equivalent and significantly different than that for AB dyads, in which As comprimised significantly less than their Type B opponents (only one AB dyad split the difference, and only in one dyad did the Type A comprimise more). Moreover, the mean composite comprimises of AA and BB dyads were zero-order, whereas that for AB dyads was not.

Subsequent to the negotiations, subjects were allowed to privately state their preferred solution to the problem (PRIVATE WIN). Thus, even though a subject may have comprimised publically, he could have privately shifted back toward his initial position. Within-group t-tests revealed that all shift scores were zero-order (all ts<1, ns), indicating that subjects in general did not report private solutions significantly different than those they publically agreed upon.

Finally, a 3(dyad type)X2(hi versus low JAS score member)X2(self versus other) multivariate analysis of variance (MANOVA) was conducted

on the four post-negotiation ratings. Only the multivariate main effect of self versus other rating was statistically significant: $F(4,121)=4.93$, $p<.001$, indicating that As and Bs perceived each other and were perceived by others similarly. Contrasts revealed significant effects for leadership: $F(1,134)=4.55$, $p<.04$; dominance: $F(1,134)=6.35$, $p<.02$; and understanding: $F(1,134)=8.28$, $p<.005$. As seen in Table 4, all means favored self over other (lower mean ratings indicate more favorable assessments).

Insert Table 4 About Here

Adding a dummy-coded variable indicating whether the subject won, tied, or lost the negotiation as a covariate failed to change this pattern of results.

To summarize, three of the four outcome measures failed to reveal any A/B differences. The RECORD analysis revealed similar rates of volunteering to represent the dyad; the PRIVATE WIN analysis demonstrated that neither As or Bs gave private solutions significantly different than their mutual, public positions; and the only effect to emerge in the analysis of rating-scale evaluations of self versus other was that the rater perceived himself as being more instrumental (dominant and leader-like) and expressive (understanding) than his opponent.

The primary (PUBLIC WIN) analysis revealed a significant confirmation of the hypothesis that As should successfully pursuade their Type B opponents to publically advocate a position relatively further removed from that which they initially advocated. As expected,

extreme Type As did not differentially influence themselves in this manner, as nor did extreme Type Bs.

The following analyses focused upon bargaining processes; that is, on the negotiative styles of As and Bs.

Process Measures

The inter-rater reliabilities of the process measures were computed as the Pearson correlations between raters' ratings (Magnusson, 1967), and are reported in Table 5.

Insert Table 5 About Here

The mean intra-scale reliability of .88 corresponds to a multivariate reliability of .97, indicating that these data were reliable (Yarnold, in press). The means of the raters' ratings were used in the following analyses.

Inter-Dyad Analyses

In order to determine if the absolute amount of dominant behavior occurring during negotiations varied as a function of dyad type, the process data for both members of a dyad were summed for each variable. The inter-dyad comparisons will be used to test the hypothesis that the greater the sum total of the JAS scores over a dyad, the more heated (i.e., cross-dominant) the exchanges within the dyad will be. Thus one expects more total arguments, words, rebuttals, time, and rated dominance when an extreme A an an extreme B negotiate as compared with exchanges in which two Type Bs negotiate. The same should be true for the AA versus AB, and therefore AA versus BB comparisons. The number of give-ins is expected to be least in AA dyads and greatest in AB

dyads (with Type Bs acquiescing), and BB dyads are expected to be intermediate. Mean dyadic totals are given by dyad type for each process measure in Table 6.

Insert Table 6 About Here

The observed pattern of the means lends a perfect confirmation of the hypotheses. Statistical analyses were performed to ascertain which results were reliable. A MANOVA performed on these data was significant: $F(12,52)=5.18$, $p<.0001$. Contrasts (ANOVAs and DMRTs) revealed that dyads differed in the number of DISCRETE ARGUMENTS made: $F(2,31)=3.64$, $p<.04$ (AA>BB). Dyads also differed in the number of REBUTTALS made to challenge discrete arguments: $F(2,31)=4.81$, $p<.02$ (AA>AB=BB). The number of GIVE-INS also differed: $F(2,31)=4.97$, $p<.02$ (AB>AA=BB), as did the TIME taken by dyads to reach consensus: $F(2,31)=8.17$, $p<.002$ (AA>AB=BB). Finally, the DOMINANCE ratings were also significantly different: $F(2,31)=26.41$, $p<.0001$ (AA>AB>BB).

Intra-Dyad Analyses

In order to determine whether dyad members exhibited differential amounts of dominant behaviors during negotiations, the process data for low JAS score members was subtracted from that for high JAS score members, for each variable. The intra-dyad comparisons will be used to test the hypothesis that extreme As negotiating against extreme Bs should be more dominant, while As negotiating As should be equally dominant, as should Bs negotiating Bs. Mean dyadic differences are given by dyad type in Table 7.

Insert Table 7 About Here

The pattern of the means lends a 94 per-cent confirmation of the hypotheses: only the AB versus AA comparison of the number of DISCRETE ARGUMENTS was unexpected. A MANOVA revealed a marginally significant effect: $F(12,52)=1.71$, $p<.09$; thus the following analyses should be considered tentative. Contrasts revealed a significant effect for DOMINANCE: $F(2,31)=5.19$, $p<.02$ (A>B in AB dyads) and GIVE-INS: $F(2,31)=3.41$, $p<.05$ (B>A in AB dyads). The effect for REBUTTALS was marginally significant: $F(2,31)=3.00$, $p<.07$ (A>B in AB dyads).

As and Bs versus As and Bs

In order to determine whether As reacted differentially to As versus Bs and whether Bs reacted differentially to As versus Bs, a 2(Type A or B subject)X2(Type A or B opponent) MANOVA was performed on the process data, means for which are given by combination of subject and opponent type in Table 8.

Insert Table 8 About Here

The multivariate main effect of subject was statistically significant: $F(6,59)=14.29$, $p<.001$. Contrasts revealed that Type A subjects, relative to Type B subjects, issued more discrete arguments: $F(1,64)=8.57$, $p<.005$; used more words to compose them: $F(1,64)=11.42$, $p<.002$; sent more rebuttals: $F(1,64)=12.40$, $p<.0008$; gave-in less: $F(1,64)=11.39$, $p<.002$; used more time: $F(1,64)=17.49$, $p<.0001$; and were rated as being more dominant overall: $F(1,64)=60.61$, $p<.0001$.

The multivariate main effect of opponent was also statistically significant: $F(6,59)=3.13$, $p<.01$. Contrasts revealed that Bs gave-in to arguments more often when negotiating against Type As: $F(1,64)=5.00$, $p<.03$.

There was no evidence for a multivariate interaction however: $F(6,59)=1.83$, ns.

Predicting Decision Outcome

Separate stepwise multiple regressions were performed for each dyad type to predict negotiation outcome (the PUBLIC WIN measure) as a function of intra-dyad differences in the process measures. These analyses are, however, substantially underpowered due to the small sample sizes (Timm, 1975).

Only for AB dyads was the model significant: $F(2,10)=19.72$, $p<.0003$, with TIME (R-squared=.70) and DOMINANCE (R-squared=.10) entering as positively weighted predictors.

Discussion

The results offer support for the hypothesis that extreme Type A individuals are significantly more interpersonally dominant than extreme Type Bs in a forced negotiation situation.

The criterion variable of the study was the PUBLIC WIN (outcome) measure, analysis of which demonstrated that As successfully persuaded their Type B opponents to publically advocate a relatively less favorable post-negotiation position. When defining "winning a negotiation" as comprimising less (in terms of 7-point Likert units) than one's opponent, Type As in AB dyads won 85 per-cent of the negotiations. Far outshadowing the frequency of winning however, was the extent of the wins observed. Quantitatively, the Type B members of AB dyads comprimised a mean of 277 per-cent more than the Type As. Qualitatively, due to the construction of the scale, this meant changing from an initial (pre-negotiation) pro-teacher position to a

post-negotiation anti-teacher position, or visa versa. Since the initial positions of As and Bs were equally extreme, it appears that As were dramatically more persuasive than their opponents. Several qualifications which bear on this conclusion must be stated however.

First, it is unclear whether As and Bs assigned psychologically equivalent meanings to numerically equivalent scale levels; that is, a "7" for a Type A may be more or less psychologically salient than a "7" for a Type B (Torgerson, 1958). Without information regarding the psychological utilities of the individual's participating in the study for 7-point scale-values, an unequivocal interpretation of the PUBLIC WIN analysis is difficult to make (Katz & Kahn, 1978). Some literature suggests that a generalized set for more extreme responding exists among Type As, in the form of unilaterally more extreme beliefs, attitudes, answers on 7-point scales, etc. (Matthews, 1982). Since the utilities of the individuals are unknown, it cannot be determined at what level of psychological salience various response alternatives are. Future research employing experimental game tasks should consider the problem of measuring utilities of individuals participating in the study.

Also, analysis of the RECORD data (examining the relative frequencies of volunteering to represent the dyad) failed to reveal any A/B effect. It was expected that As, seeking control over the dyad's operations (Glass, 1977) would volunteer as recorder. That they did not stresses the importance of examining task salience as a potentially relevant intervening variable. The theoretical assumption is that dominance is not a trait that is exhibited transituationally but rather

is modulated by situational exigencies. One of the major aspects of the experimental context was the task. It is unclear whether or not Type As would exhibit emergent leadership if the task was more salient to, using Klinger's (1975) concept, current concerns. Although statistically insignificant, it is interesting to note that three Type As in AB dyads told their opponents (who acquiesced) to act as dyad recorder.

In the final analysis however, the AB dyads reached consensus at solutions which favored the Type As markedly. As expected, differences between the JAS scores of extreme individuals in matched dyads (AA and BB) did not bear any systematic relationship to observed differential payoffs. That is, differences in intra-dyad process and outcome measures were reliably predicted by JAS-score differences only when a Type A debated a Type B. When similarly-Typed individuals debated, JAS-score differences failed to predict differences in process or outcome measures. There is, therefore, tentative support for the "dominant Type A" hypothesis. Examination of the process data yields further support.

The intra-dyad analysis reveals that when an extreme Type A negotiates with an extreme Type B on an issue on which their initial positions are oppositely extreme, the Type A contests the issues significantly more energetically, rebutts any arguments the B presents, and successfully induces the Type B into accepting contra-position arguments and public positions more frequently and to a greater extent than when the opponent is also Type A. As was the case in the PUBLIC WIN analysis, differences between the JAS scores of members of AA and BB dyads failed to predict intra-dyad process effects.

The inter-dyad analysis revealed that pairing two extreme Type As leads to a significantly more lively exchange than pairing either an extreme A and an extreme B, or two Type Bs (the least lively exchange). In general, as the number of Type As in a dyad increased the longer the dyad required to come to concensus, the more pro-position arguments were generated, the more extravagent the verbalization of arguments, and the greater the number of rebuttals.

Finally, the analysis contrasting the interpersonal style of As and Bs as a function of the A/B Type of their opponent revealed that both Types behaved in a stable manner irrespective of what A/B Type their opponent was: As were unilaterally dominant and Bs unilaterally passive during negotiations.

Taken as a whole these results suggest that As behaved in a significantly more interpersonally competitive, aggressive, competent, and in general interpersonally dominant manner than Type Bs.

The analysis in which differential payoff between dyad members was predicted within dyad type as a function of JAS score and process measure differences is tenuous due to the small sample sizes, but sheds additional light upon the tactics employed by As and Bs during the debates. The only significant model was that for AB dyads, in which differences in the amount of time spent talking (R-square = 0.70) and in the dominance ratings made by independent observers (incremental R-square = 0.10) emerged as predictors.

Considering first the primary predictor, time is a theoretically important factor in "winning" a negotiation, all other things being equal, because of the utility it has a vehicle within which dominant or

pursuasive behaviors may be executed. Also, time is an important commodity to the Type A individual. As stated by Friedman and Rosenman (1974); "Overwhelmingly, the most significant trait of the Type A man is his habitual sense of time urgency" (p. 86). Thus it comes as no surprize that time is an important correlate of differential payoff, nor that extreme Type As monopolize time during a competitive interpersonal confrontation with an explicitly brief completion deadline.

Considering the secondary predictor of differential payoff, the dominance ratings were an outcome of protocol analysis designed to reflect the gestalt of the remaining process measures. Since the rating scales were objective and the inter-rater reliabilities high, this measure significantly boosted the residual variance in differential payoff explained by ten per cent.

Both time urgency and interpersonal dominance are manifestations of the Type A behavior pattern, and may be used to explain why Type As are more successful at winning negotiations. The question remains, however, why do As behave in this fashion?

In this study subjects were paired with another with whom they were knowingly in extreme conflict on the relevant issue, and were told they were to discuss the disagreement and reach a unanimous decision within five minutes. Thus the social context was one of a brief (i.e., rapid), competitive interpersonal exchange with initially bi-polar opposite positions. According to Glass (1977), Pattern A behavior represents an attempt on the part of a Type A individual to assert and maintain control over stressful events in (or aspects of) his/her

environment. Thus, events which are perceived by Type A individuals to be potentially uncontrollable are expected to elicit Pattern A responding. Given that the method of this study presents a potentially uncontrollable situation to the subjects, the data are consistent with the uncontrollability theory.

An interesting question is whether these results will replicate independently of the stimulus question. For example, would As strive to defeat the Bs if the stimulus issue was of no consequence to them? Future research should consider the role of issue (and in general, task) salience to the subjects. Another question is whether these results are invariant over sex. Since research has shown that male and female As are equally dominant and male and female Bs are equally passive (Grimm & Yarnold, in press), no interactions with sex are expected. Finally, it has not been demonstrated that As are generally more interpersonally dominant than Bs, but rather that they are within the context of a demand set for dominance. It is unknown whether Type As encounter situations (occupational, peer, and/or marital) which elicit dominance struggles outside of the laboratory.

General Discussion

The results of these and other studies suggest that interpersonal dominance warrents attention as a primary correlate of Pattern A behavior. While it is important that subsequent research efforts explore the socialization and cross-situational generalizability of the Type A's enhanced dominance, human research is needed to investigate the relation between Type A behavior pattern/dominance complex and cardiovascular disease. Animal research has indicated that dominance

struggles lead to fixed hypertension (Henry, Stephens, & Sentisteban, 1975) and elevated plasma corticosterone (Bronson, 1973). Moreover, corticosteroids have been shown to play a significant role in the etiology of cardiovascular disease (Goldstein & Brown, 1977; Ross & Glomset, 1976; Kuller, 1976). Perhaps the Type A individuals who succumb to cardiovascular disease are those with a strong need for dominance and find themselves in situations (occupational, peer and/or marital) that elicit a chronic struggle for ascendancy. Additional research is needed to define the situational parameters of the Type A's dominance behavior, and the physiological concomitants of dominance struggles. Research of this nature may bring us closer to identifying what behaviors of the Type A person should be altered to reduce the risk of heart disease.

Footnotes

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Table 1

Mean Jas Score by Group

	JAS Score		
Group	N	X	sd
Bs from BB	28	3.50	1.37
Bs from AB	14	3.64	0.93
As from AB	14	13.21	1.48
As from AA	28	12.79	1.75

Table 2

Initial Conflict by Dyad

	Leave (Max=7)			Remain (Min=1)			Conflict (Max=6)		
Dyad	N	X	sd	N	X	sd	N	X	sd
BB	14	6.43	0.51	14	1.43	0.51	14	5.00	0.55
AB	14	6.57	0.65	14	1.29	0.47	14	5.29	0.73
AA	14	6.79	0.43	14	1.29	0.47	14	5.50	0.52

Table 3

Mean Composite Compromise by Dyad Type

Dyad Type	N	Compromise	sd	$t>0$	p
BB	11	0.54	3.30	0.55	ns
AB	13	-2.46	2.22	-3.99	.002
AA	10	0.60	3.53	0.54	ns

Table 4

Mean Ratings of Self and Other on 4 Scales

	Self		Other	
Scale	X	sd	X	sd
Leadership	3.24	1.07	3.65	1.18
Dominance	3.43	1.25	3.93	1.06
Understanding	2.56	1.01	3.09	1.13
Likeability	2.65	0.73	2.68	0.85

Table 5

Reliabilities of Process Measures

Measure	Reliability
TIME	0.90
DISCRETE ARGUMENTS	0.81
NUMBER OF WORDS	0.98
GIVE-INS	0.89
REBUTTALS	0.87
DOMINANT DELIVERY	0.84

Table 6

Mean Dyadic Totals on Process Variables

	Dyad Type					
	BB		AB		AA	
Variable	X	sd	X	sd	X	sd
DISCRETE	4.73	2.41	5.69	3.07	8.10	3.28
TOTAL WORD	483.09	114.86	513.00	263.91	652.00	149.47
REBUTTAL	0.82	1.33	1.54	1.45	3.50	3.10
GIVE-INS	1.00	0.45	2.00	1.68	0.50	0.85
TOTAL TIME	217.78	46.79	260.15	67.33	337.45	87.77
DOM DELIV	6.00	1.48	9.31	2.06	11.20	1.23

Table 7

Mean Dyadic Differences on Process Variables

	Dyad Type					
	BB		AB		AA	
Variable	X	sd	X	sd	X	sd
DISCRETE	0.36	1.75	0.92	1.71	1.30	2.50
TOTAL WORD	45.64	164.39	127.31	78.84	41.80	130.60
REBUTTAL	-0.09	0.94	0.62	0.96	-0.30	0.95
GIVE-INS	-0.09	0.94	-1.23	1.88	0.10	0.74
TOTAL TIME	8.36	55.23	32.61	56.89	6.63	62.05
DOM DELIV	0.36	1.91	1.92	1.66	-0.20	1.32

Table 8

As and Bs Versus As and Bs on Process Measures

Subject	Type A				Type B			
Opponent	Type A		Type B		Type A		Type B	
Variable	X	sd	X	sd	X	sd	X	sd
DISCRETE	4.05	2.11	3.31	1.75	2.38	1.76	2.36	1.47
TOT WORD	326.00	98.95	320.15	174.68	192.85	142.49	241.55	100.60
REBUTTAL	1.75	1.59	1.08	1.12	0.46	0.52	0.41	0.80
GIVE-INS	0.25	0.55	0.38	0.65	1.62	1.66	0.50	0.51
TIME	168.72	52.42	146.38	43.70	113.77	44.45	108.89	35.58
DOM DELIV	5.60	0.88	5.62	1.04	3.69	1.55	3.00	1.20